The following is the title and the abstract for the paper that Leon Alkalai submitting to the 2nd IAA Symposium on Small Satellites for Earth Observation, April 12-16, 99 in Berlin, Germany.

"Advanced Microelectronics Technologies for Future Small Satellite Systems"

Leon Alkalai
Center for Integrated Space Microsystems (CISM)
Jet Propulsion Laboratory
California Institute of Technology

Future small satellite systems for both Earth observation as well as deep-space exploration are greatly enabled by the technological advances in deep sub-micron microelectronics technologies. Whereas these technological advances are being fueled by the commercial (non-space) industries, more recently there has been an exciting new synergism evolving between the two otherwise disjoint markets. In other words, both the commercial and space industries are enabled by advances in low-power, highly integrated, miniaturized (low-volume), light-weight, and reliable real-time embedded systems. Recent annoucements by commercial semiconductor manufacturers such as IBM, Hitachi, TI, etc. to introduce Silicon On Insulator (SOI) semiconducstor technology into their commercial product lines is driven by the need for high-performance low-power integrated devices. Moreover, SOI has been the technology of choice for many space semiconductor manufacturers where radiation requirements are critical. In fact, the New Millennium Program Deep-Space 1 mission is currently flying as a validation experiment an ultra low-power design using 0.25 micron SOI technology developed at MIT/Lincoln Laboratory. This technology has inherent radiation latch-up immunity built into the process, which makes it very attractive to space applications. In this paper, we elaborate on a number of advanced microelectronics and avionics technologies that are of significant benefit to both the commercial as well as the future space small satellite industries. Such a synergistic technology roadmap ahead may truly enable quick turn-around, low-cost, and highly ca pable small satellite systems for both Earth observation as well as deep-space missions.

Dr. Leon Alkalai
Center Lead
Center for Integrated Space Microsystems
JPL MS 303-310
Pasadena, CA 91109
Tel. 818 354-5988, Fax. 818 393-5013
E-mail: Leon.Alkalai@jpl.nasa.gov
URL: http://cism.jpl.nasa.gov